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ABSTRACT

A description is given of a college course in survey research and attitudinal measurement offered by the School of Education at the University of Louisville. The graduate level course focuses on the principles of social research; survey research methods; and data analysis, interpretation, and application. National survey data are used to teach all facets of index and scale construction, including item selection and analysis and internal and external validation for a variety of different kinds of indexes and scales. Through the use of national survey data, students are also able to: (1) apply principles of survey research to studies conducted at a national level; (2) analyze data from national surveys which include relatively large numbers of respondents; (3) gain insight into how questionnaires are constructed for very large and disparate samples; and (4) use a mainframe computer. This paper first describes the course, its background, and its syllabus; it then describes briefly two methods of increasing student participation; and finally, it describes in specific terms and with examples how national survey data are used to teach index and scale construction. (Author/JD)

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The Use of National Survey Data in Teaching Methods of Survey Research

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For Presentation at the American Educational Research Association

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Running Head: NATIONAL SURVEY DATA

Introduction

The purpose of this paper is to describe an innovative approach to teaching principles of survey research and attitudinal measurement. The course is graduate level and focuses on the principles of social research; survey research methods; and data analysis, interpretation, and application. National survey data provided by the Inter-university Consortium for Political and Social Research is used to teach all facets of index and scale construction, including item selection and analysis and internal and external validation for a variety of different kinds of indexes and scales. Through the use of these survey data (from public opinion polls, Social Security Administration surveys, and national teacher assessment surveys), students are able to construct indexes and scales to assess nationwide attitudes along any of almost limitless dimensions. Moreover, through the use of these national survey data, students are also able to (1) apply principles of survey research to studies conducted at a national level, (2) analyze data from national surveys which include relatively large numbers of respondents, (3) gain insight into how questionnaires are constructed for very large and disparate samples, and (4) use a mainframe computer. The paper first describes the course, its background, and its syllabus; it then describes briefly two methods of increasing student participation; and finally, it describes in specific terms and with examples how national survey data are used to teach index and scale construction.

Course Background and Syllabus

During the latter part of the 1970s, the School of Education at the University of Louisville made a strong case to the Kentucky State Council on Higher Education for an education doctorate with an emphasis on urban education. As it became increasingly evident that the State Council would act favorably on this request, and since urban education research was to be an integral component of the new doctorate, I was encouraged to develop a course which would fit the label "survey research and attitudinal measurement." I did so, and I taught it for the first time during the Fall 1982 semester. I have taught the course every fall since then with both successes and failures. All in all, the effort I've put into making the course a useful one has led me to incorporate what I am increasingly convinced are innovative features that could benefit similar courses offered in other schools.

The purposes for this course are very broad. Basically, they are to give students a sense of what surveys researchers do and how they go about doing it by teaching the principles of social research, survey research methods, and data analysis, interpretation and application. The breadth of the course is a source of both strength and weakness. Indeed, an oft cited student concern is that the course tries to accomplish too much. This is illustrated in the reading list which includes Earl R. Babbie's Survey Research Methods, Hubert M. Blalock's Basic Dilemmas in the Social Sciences, Floyd J. Fowler's Survey Research Methods, Myron Glazer's The

Research Adventure, and Sudman and Bradburn's Asking Questions: A Practical Guide to Questionnaire Design.[1] These readings contribute to the students' overall understanding of survey research in that each addresses one or more of the course's purposes. For example, Glazer's book vividly sets forth the ethical and moral dilemmas of survey research while Blalock describes other more technical concerns with respect to measuring human behavior. Babbie's Survey Research Methods is the basic textbook for the course. It focuses on a wide variety of survey research topics including the scientific and philosophical context of survey research; survey research design and analysis; and the social and scientific perspectives of survey research. Sudman and Bradburn's book is a comprehensive and technical treatment of questionnaire construction and serves as an effective supplement to the Babbie text. In addition, the students make exhaustive use of the SPSS Manual to complete the course requirements described below and they also read some material on qualitative research in order to draw comparisons to survey research.

[1]A complete list of required textbooks for the course is appended.

Methods of Increasing Student Participation

Discussion Teaching and Survey Research

At first glance, a course on Survey Research and Attitudinal Measurement might seem an unlikely candidate for spirited class discussion. There are a number of ethical and technical issues involved in the course, however, and following David A. Garvin's suggestions on discussion teaching I have been quite successful in getting class members to participate in discussions. Garvin is on the faculty of the Harvard Business School; his approach to discussion teaching and questioning was described in the Chronicle of Higher Education (July 25, 1984, p. 20).

Each week I ask one student to be the discussion leader. The other class members are expected to prepare as well so that they can respond to the leader's critique of the weekly reading assignment.

For my own part, using Garvin's ideas, I formulate a number of questions for each class that focus on the issues to be covered and encourage students to consider these issues from different perspectives. I initiate discussions with broad, diagnostic questions and follow up with questions of action or decision, extension, synthesis, priority, clarification, and fact, as appropriate.

Students report that the expectations for class participation create some anxiety and discomfort, but that the structure provided for each discussion greatly increases their commitment to completing assignments and their understanding of the material covered.

Class Project

I must assume that each student who enrolls in this course has some reason for doing so. (The course is not required for any degree, although doctoral level students in the urban education program are encouraged to take it.) The very first day of class, I ask the students why they are taking the course and what they expect to get out of it. I point out to them that they will be required to prepare a project that has few specific requirements other than to be consistent with the purpose of the course and help them explore an area of personal interest. Early on, they are expected to prepare a project proposal which must include the following sections:

project design/rationale/purpose

sampling design

questionnaire design (including steps they will follow in developing the questionnaire)

data collection and analysis

report of results

Students are allowed to work collaboratively, although more is expected from collaborative than from individual projects.

One additional requirement related to the project is that students present a summary of the completed project to the class, much as papers are read at professional conferences. In fact, I spend some class time discussing ways to summarize the results of a research project in both oral and written forms.

The quality of the projects I have received has been mixed, but

several students have done outstanding work. An obvious though implicit goal of the course is that students be able to carry out a survey research project from beginning to end, from conceptualizalization to analysis of results to conclusions. A number of students have done just that, which I consider quite an accomplishment in a three-credit-hour course.

Use of National Survey Data

in Index and Scale Construction

A very significant part of this course focuses on the secondary analysis of national level survey data. The data are in machine-readable form and are stored on computer disks at the University of Louisville. The data were sent me at my request by the Inter-university Consortium for Political and Social Research (ICPSR). ICPSR is located in the Institute for Social Research at the University of Michigan and constitutes a partnership between that university's Center for Political Studies and well over 200 member universities and colleges. The ICPSR archives receive, process, and distribute data on a wide variety of social issues from over 130 countries, including attitudinal surveys, census records, election returns, educational data, international and cross-cultural data, and legislative records. These data are outstanding tools for classroom exercises as well as for basic research. New data--surveys, censuses, other forms of aggregate data—are continually sent to ICPSR by scholars and organizations around the world.

I have used ICPSR data to develop an innovative and effective way of teaching the principles of index and scale construction. Through the use of these data to develop indexes and scales, my students have had to learn a very important computer language, SPSS: the use of codebooks and coding; the intricacies of samples and sampling; the significance of data and data processing; and

design requirements of survey instruments including questionnaires and interview schedules.

The students in this course make extensive use of the ICPSR data in two ways: in completing computer assignments and in constructing indexes and scales. In the three semesters I have taught this course, I have used three data sets supplied by ICPSR. These three sets are described below.

1. National Council on Aging; Myth and Reality of Aging, 1974.

   The survey was conducted by Louis Harris and Associates during June and July, 1974. This study contains the views of 4254 respondents on the stereotypes and reality of aging. Two questionnaires were used, one asking 18 to 64-year-olds their perceptions of how people 65 and over felt about aging, and the second asking people 65 and over how they actually felt. In addition, both groups were asked general questions on attitudes toward growing old, their interests, and demographic characteristics.

   There were four national samples: 1) a cross-section of approximately 1500 adults 18 years and older; 2) an oversample of approximately 2400 adults aged 65 years and over; 3) an oversample of approximately 360 adults aged 55-64; and 4) an oversample of approximately 200 blacks aged 65 and over. There are 865 variables for 4254 respondents.

2. Fisher, Charles W.; Beginning Teacher Evaluation Study, 1972-1978.

   The California Commission for Teacher Preparation and Licensing sponsored the Beginning Teacher Evaluation Study (BTES) with funds provided by the National Institute of Education (Department of Health, Education and Welfare). The study was a multi-phase project which began in 1972 and was completed in June 1978. The overall purpose of the research program was to identify teaching behaviors which are effective in promoting learning in reading and mathematics in elementary schools.

3. CBS News; CBS News Polls, 1977-1979, Parts 1-5.

   a. Part 1. January 1977 Inauguration Poll
   b. Part 2. June 1978 Education Poll
   c. Part 3. September 1978 Poll on Mid-East Summit Meeting
   d. Part 4. December 1978 Poll on China
   e. Part 5. October 1979 Poll on Current Issues

   This study consists of five surveys conducted by CBS News in 1977-1979. In each survey, telephone interviews were conducted with approximately 1000-1500 randomly selected adults. The polls concentrated on an event or set of issues of current interest, as well as gathering background information and other political and social opinions.

The remainder of this paper describes the way these ICPSR data were used with each of the three computer assignments and with the index and scale construction exercises.

Computer Assignments

Students are required to complete three computer assignments using the ICPSR data, each assignment building on the previous one. Part 1 of the first computer assignment introduces students to SPSS, the statistical package that is used throughout the course. The students are given hypothetical data and a code book, which I have reproduced below.[2]

Students are expected to run programs giving frequencies for sex, SES, and education level; descriptive statistics for various intelligence scores; cross-tabulation for intelligence and sex; a scattergram for intelligence and math and verbal test scores; and two-way analysis of variance for intelligence, sex, and SES.

[2]The Codebook, data, and tasks for Part 1 of the first computer assignment were developed by Professor Joseph Petrosko of the University of Louisville's School of Education. I have used this exercise in my class and I am describing it here with his permission.

Codebook for Computer Problem

Column	Variable	Variable Name	Range of Values	Value Labels
6	sex	SEX	1-2	1=male 2=female
9	socio-economic status	SES	1-2	1=low SES 2=high SES
12	education level	EDUC	1-2	1=college 2=no college
18-19	math test score	MATH	0-20	
25-27	intelligence test score	IQ	0-160	
33-34	verbal test score	VERB	0-25	

20 cases of data

6	9	12	18	25	33	Card Columns
1	1	1	14	97	12	
1	1	1	15	100	18	
1	1	1	11	95	9	
1	2	1	10	95	10	
1	1	1	12	100	14	
1	2	1	12	99	13	
1	2	2	16	106	17	
1	2	2	16	102	18	
1	1	2	15	110	13	
1	1	1	12	104	10	
2	1	2	19	120	18	
2	1	2	20	125	21	
2	2	2	19	122	19	
2	1	1	16	108	14	
2	1	2	16	112	15	
2	2	2	17	114	18	
2	1	2	17	101	16	
2	2	1	14	101	13	
2	2	1	12	95	14	
2	2	2	17	104	16	

Part 2 of this same assignment uses the 1978 CBS News Poll on Education. For these data, students are asked to run a frequency program for geographic location, type of residence, sex, quality of public school education, quality of public school teachers, attitude toward racial integration and education, and attitude toward busing. In addition, they are asked to empirically test two questions:

1. Do the attitudes of Americans toward education depend upon their geographical location in the United States, their type of residence (rural, urban, suburban, small city) or their sex? More specifically, do these factors affect perceptions of the quality of public school education and of teachers?

2. Do location of residence, type of residence, and sex affect attitudes toward racial integration of schools and busing?

The second computer assignment is more open-ended. For this assignment, the students can use one or more of the five CBS News polls. The purpose of this second assignment is to introduce the students to one of the most basic methods of index construction—combining conceptually similar items based on their face validity.

Students are asked to create five separate indexes which measure different attitudinal dimensions, such as attitude toward school teachers, or attitude toward U.S. foreign policy vis-a-vis South Africa (from the January 1977 inauguration poll). The indexes are to be created by combining a minimum of three conceptually similar items.

Additionally the students are expected to determine the

frequencies for each of the variate values for all five indexes, determine the median value, and, using the SPSS recode facility, change the five indexes to dichotomous (two-level) variables.

Next, the students need to determine whether or not and to what extent values on the five newly created indexes are affected by three separate independent variables of their choosing (e.g., region of the country, age, sex), to prepare tables with appropriate headings and labels and which include the appropriate statistics to report the results. And finally, they write a brief report describing the steps they followed in developing the indexes and summarizing the results.

The final computer assignment is somewhat less structured than either of the two previous assignments. The data base for this third assignment is the National Council on Aging's study entitled Myth and Reality of Aging. This is a large study which includes 865 variables for 4254 respondents. The assignment was designed to coincide with the portion of the syllabus on survey research analysis, which includes index and scale construction and the "elaboration model."[3]

Students are asked to select from among the 865 variables in this study at least five questions which attempt to elicit respondents' attitudes toward some aspect of the lives of the

[3]The elaboration model, developed by Paul Lazarsfeld at Columbia University, focuses on analyzing empirical relationships among variables in order to interpret those relationships. The elaboration model is discussed at length in E.R. Babbie, Survey Research Methods, pp. 281-96.

elderly (e.g., attitude toward the right of the elderly to drive an automobile). The items ought to have face validity, that is, they ought to appear on the surface to measure a single attitudinal dimension.

Students are then expected to test for the internal validity of the items by testing for the bivariate relationships among the items and then for the multivariate relationships. I then ask them to test for significant differences in this index by two separate independent variables.

Finally, using the elaboration model, students introduce and determine the effects of two additional test variables (one antecedent, one intervening) and write a report. The final report describes how the index was constructed (including a discussion of the validation techniques and the bivariate and multivariate relationships among the items) and includes a discussion of both the nature of the relationship between the independent and dependent variables and the effects of the test variables on the original relationship.

Index and Scale Construction Exercises

I developed two exercises to use in class. Using data from the CBS News Poll on Education, the first exercise focuses on an important feature of index construction—bivariate and multivariate relationships among items in an index. This CBS poll is concerned with Americans' attitudes toward education, more specifically, whether or not the public feels education has improved over the last generation. The students select three items from the poll that appear

to measure attitude toward education on three separate but nonetheless related dimensions--in this case, teachers, schools, and schoolbooks. The three items read:

1. Do you think most public school teachers today are better, about the same, or worse than the teachers you had as a child?

2. In general, do you think the education most children are getting today in public schools is better, about the same, or worse than the education you received?

3. Do you think the schoolbooks today are better, about the same, or worse than the schoolbooks you read?

The class assigns variate values for each question to one of two categories—"better" or "worse." They quickly learn, however, that responses to any one item do not necessarily indicate a positive or negative attitude toward educational generally. Rather, they see that these three questionnaire items provide three independent indicators of respondents' relative attitudes toward contemporary public school education.

However, to the extent that each of the items measures the same general dimension, there should be some correspondence. Those respondents who appear more positive in terms of one item should be more likely to appear more positive in terms of the other items. There should be an association between the responses to two items. The students ascertain this association through a bivariate analysis of each combination of the three items.

The class examines the bivariate relationships presented in Table 1 below and decides whether or not all three items measure the

same variable by finding the relative strengths of the relationships among the three dimensions. For example, the first part of Table 1 shows that 74.3 percent of those indicating a more positive attitude toward schools also indicated a more positive attitude toward textbooks while only 37.6 percent indicated a more negative attitude toward schools in combination with a more positive attitude toward textbooks. The strength of this relationship may be summarized as a 36.7 percentage point difference (74.3 percent minus 37.6 percent). Using the same type of analysis, the relationship between respondents' attitudes towards schools and teachers may be summarized as a 33.3 percentage point difference; and between attitudes toward teachers and textbooks, a 30.6 percentage point difference.

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INSERT TABLE 1 HERE

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Thus the expected bivariate relationships in this exercise do recommend the three items' inclusion in a composite index. But before reaching a definitive conclusion on the matter, the students need to examine the multivariate relationships among the items. The students find that examining multivariate relationships is an effective way of eliminating those items which do not contribute to the index. For example, if a given item is unrelated or only poorly related to the index, it is probable that the other items are washing out its contribution. An examination of the multivariate

relationships will isolate those items which are unrelated or are only poorly related to the index. From an examination of the multivariate relationships among these particular three dimensions (summarized in Table 2, A-C below), the students learn that not all items make an independent contribution to the index. A review of part C of this table shows that of the 251 respondents indicating better teachers and better schools, 71.3% indicated that books are better. And of the 263 respondents who indicated that schools are better but teachers are worse, 70.0% indicated that books are better. Thus, the independent contribution of this item--attitude toward teachers—to the index is minimal.

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INSERT TABLE 2 HERE

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The second exercise, which uses the National Council on Aging's Study, the Myth and Reality of Aging, has two parts. The first part again demonstrates the bivariate and multivariate internal validation technique for index construction; the second part demonstrates how a Guttman scale is developed and tested. An index provides an ordinal ranking of respondents on a variable. Moreover, an index assumes that all items are equally important. Scales, on the other hand, tap structures among the items; that is, scales assume that the items which comprise the index have different intensities. This exercise (shown below) is particularly useful in that the same items can be used to construct an index and then to form a Guttman scale.

Use of this data for the second part of the exercise is particularly gratifying insofar as it yields practically a textbook example of a Guttman Scale. The example (See Part 2) below demonstrates a Guttman Scale which attempts to measure advocacy toward the elderly. The three items which comprise the scale indicate whether or not the respondents feel that the elderly are friendly and warm, are capable of getting things done, and are sexually active (disposition, efficiency, sexuality). Data on the responses to these three items are given to the students. The students then determine whether or not a "scalar" exists among the responses to the three items. As you can infer from Exercise 2 below, such a scalar does exist. This last exercise requires a high level of comprehension of the principles of attitudinal measurement and thus constitutes an appropriate culminating experience for the course.

Exercise

Part I

To test your understanding of index construction, specifically of the need to look at the bivariate relationship among items, I selected three questions from the Social Security study on the elderly. The three items appeared (face validity) to provide an indication of whether or not the sample of respondents were more (advocates) or less (nonadvocates) supportive of the elderly. For each of the three items, the language of the question was consistent: Would you say most people over 65 years of age are very ____, somewhat ____, or hardly at all ____? Specifically, the three items were as follows: 1. Friendly and warm (disposition), 2. Capable of getting things done (efficiency), and 3. Sexually active (sexuality). The response categories for each of the three items were as follows: 1) Hardly at all, 2) Somewhat, 3) Very, 8) Not sure, and 0) Missing. I used the SPSS recode facility to establish dichotomous response categories. I labeled the two categories "low advocacy" (response categories 1,2, and 8) and "high advocacy" (response category 3). The bivariate results follow:

Disposition

	Low	High	
Low	67.3%	59.7%	(X^2 = 25.86, p .01)
Efficiency			
High	32.7	40.3%	
	100.0%	100.0%	

Disposition

	Low	High	
Low	95.2%	92.5%	(X^2 = 13.12, p .01)
Sexuality			
High	4.8%	7.5%	
	100.0%	100.0%	

Efficiency

	Low	High	
Low	98.1%	86.6%	(X^2 = 222.1, p .01)
Sexuality			
High	1.9%	13.4%	
	100.0%	100.0%	

Examine these three bivariate relationships and discuss whether or not and why your examination of these relationships supports the belief that the three items measure the same variable: advocacy of the elderly. Be specific.

Part 2

To test your understanding of scale construction in general and of Guttman Scaling in particular, we will consider the same three items that were considered in the index construction question (Part 1). I want you to determine, with appropriate and specific explanation and discussion, whether or not the three items included in the index essentially form a Guttman Scale. A univariate summary of the three items follows:

	Disposition	Efficiency	Sexuality
1. Non Advocate (Low)	2377 (56.1%)	2702 (64.0%)	3870 (91.0%)
2. Advocate (High)	1861 (43.9%)	1521 (36.0%)	249 (6.0%)
3. Missing	16	31	135

The table below summarizes all possible response patterns (The + indicates the advocacy response; the - indicates the nonadvocacy response). The "Number" column indicates the number of respondents in each response pattern; the "Scale" column indicates the scale score which would be allotted to all respondents in each of the response patterns. To accurately discuss whether or not a scalar exists, you will need to replace the question marks with the correct numbers.

	Disposition	Efficiency	Sexuality	Number of Respondents	Scale Score	Total Scale Errors
	+	+	+	109	?	?
Scale Types: Total=3315	+	+	-	623	?	?
	+	-	-	1056	?	?
	-	-	-	1527	?	?
	-	+	-	652	?	?
Mixed Types: Total = 789	+	-	+	28	?	?
	-	-	+	21	?	?
	-	+	+	88	?	? (Total)

Your discussion of whether or not a scalar exists among the responses to all three items must be specific. For example, the total number of possible predictions, the total number of correct predictions, the total number of errors, and the "coefficient of reproducibility" ought to be included in your response. Of course your response ought to conclude whether or not this "scale" is appropriate and why it should or should not be used in lieu of an index composed of these three items.

Table 1
Bivariate Relationships of Attitude
Toward Education Items

	Schools	
	Better	Worse
Books		
Better	74.3	37.6
Worse	25.7	62.4
	100.0%	100.0%

	Schools	
	Better	Worse
Teachers		
Better	48.8	15.5
Worse	51.2	84.5
	100.0%	100.0%

	Teachers	
	Better	Worse
Books		
Better	73.9	43.3
Worse	26.1	56.7%
	100.0%	100.0%

Table 2
Multivariate Relationship of Attitude
Toward Education Items[4]

Percent Indicating "Better" Schools	A Teachers	
	Better	Worse
Better Books	69.6% (257)	44.4% (367)
Worse	46.2% (91)	16.6% (481)

Percent Indicating "Better" Teachers	B Books	
	Better	Worse
Better Schools	49.2% (364)	33.3% (126)
Worse	25.1% (271)	9.8% (449)

Percent Indicating "Better" Books	C Teachers	
	Better	Worse
Better Schools	71.3% (251)	70.0% (263)
Worse	51.1% (133)	25.9% (726)

[4]Table 2 has been presented somewhat differently from Table 1. For example, in Part A, the sample of respondents has been categorized in four groups according to their attitudes toward teachers and their attitudes toward textbooks. The numbers in parentheses indicate the number of respondents in each group. (For example in Part A, 257 respondents indicated that teachers are better and also indicated that textbooks are better.) For each of the four groups, the percentage of the respondents in that group indicating that schools are better has been presented. Thus, of the 257 respondents indicating better teachers and better textbooks, 69.6% also indicated that schools are better. And of the 481 respondents who indicated that both teachers and textbooks are worse, only 16.6 percent indicated that schools are better.

APPENDIX
(Required Textbooks for the Course)

1. Earl R. Babbie. Survey Research Methods. Belmont, California: Wadsworth Publishing Company, 1973.

2. Hubert M. Blalock, Jr. Basic Dilemmas in the Social Sciences. Beverly Hills, California: Sage Publications, 1984.

3. David M. Fetterman. Ethnography in Educational Evaluation. Beverly Hills, California: Sage Publications, 1984.

4. Floyd J. Fowler, Jr. Survey Research Methds. Beverly Hills, California: Sage Publications, 1984.

5. Myron Glazer. The Research Adventure. New York, Random House, 1972.

6. Norman H. Nie and others. SPSS (Statistical Package for the Social Sciences). Second Edition. New York: McGraw Hill, 1975.

7. Seymour Sudman and Norman M. Bradburn. Asking Questions: A Practical Guide to Questionnaire Design. San Francisco: Jossey-Bass, 1982.